

Remarks

Claims 1-9, 11-23, 27-30 and 33-61 are pending and under consideration in the application. Claims 10, 24-26 and 31-32 are canceled herewith. Independent Claims 1 and 44 are amended to incorporate the language of claims 31 and 32. The word “fluid” or “fluids” has been replaced with “liquid” or “liquids”, respectively, where it appears in all claims.

Rejections under 35 USC §103

Claims 1, 3-9, 11-19, 22-23, 28-30, 33-44 and 46-60 are rejected under 35 USC §103(a) in view of Shibamoto, U.S. Patent No. 5,672,810, in view of Gilson, U.S. Patent No. 3,621,263; Claims 10, 20, 21, 34-27 31, 32 and 45 are rejected under 35 USC §103(a) in view of Shibamoto, Gilson and Oberhauser, U.S. Patent No. 6,190,550. Applicants traverse both rejections and respectfully request reconsideration.

As previously explained, the claimed invention is directed to an injection device for an ultra-high pressure liquid chromatography system, one which will function at very high pressures, well above the pressure ranges used in a typical HPLC system, which are around 4,000 psi. These features are now reflected in independent claims 1 and 44, which specify, *inter alia*, a liquid chromatography system having a maximum pressure between approximately 15,000 and 120,000 psi. These features are not remotely taught or suggested in Shibamoto, which is directed to a gas chromatography system, and which could not possibly support a pressure scheme of this nature, due to the use of a septum-based sample-injection system. A gas system cannot be adapted for use in an high pressure system such as HPLC, nor an ultra-high pressure system as in the claimed invention.

It is conceded in the office action that neither Shibamoto nor Gilson teach pressure ranges for high pressure liquid chromatography. The missing teaching is said to be shown in Oberhauser at column 6, lines 24-25 ("input pressures, typically up to several thousand psi"). This is the only mention of pressure in the entire disclosure of Oberhauser. Oberhauser is primarily concerned with a detector for chromatography systems for monitoring electromagnetic properties of the flow stream upstream from the detector used to detect solutes in the eluant; Oberhauser does not disclose an injection device in which the components must withstand pressures 15,000 and 120,000 psi. This element of the present claims is neither taught nor suggested by Oberhauser, nor either of the other references cited.

The claimed invention must be considered as a whole. None of the references disclose an ultra-high pressure liquid chromatography apparatus, and therefore one skilled in the art could not pick and choose features shown in these references and arrive at the present invention. It is asserted in the office action that these high pressures are somehow shown in Oberhauser or are otherwise "known in the art of high pressure chromatography". Again, no citation to any reference is provided showing use of these pressures, nor is there any citation to a known liquid chromatography device that operates at these very high pressures. As noted above, a gas chromatography system does not operate in this high pressure range. Thus there is no teaching or suggestion cited anywhere that would lead one of skill to modify the components of the Shibamoto system by combining it with the teachings of Gilson and Oberhauser, or to the selection of the particular features of the device of the invention for overcoming leakage problems in a high pressure system.

Based on the above noted differences in the claimed invention and the

teachings of Shibamoto, Gilson and Oberhauser, Applicants respectfully submit that Claims 1 and 44, and all dependent claims, are not obvious in view of these references. Withdrawal of all §103 rejections is respectfully requested.

Conclusion

Applicants submit that all outstanding issues have been addressed, and that Claims 1-9, 11-23, 27-30 and 33-61 are in condition for allowance. A Notice of Allowance is respectfully requested at an early date.

Respectfully submitted,

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